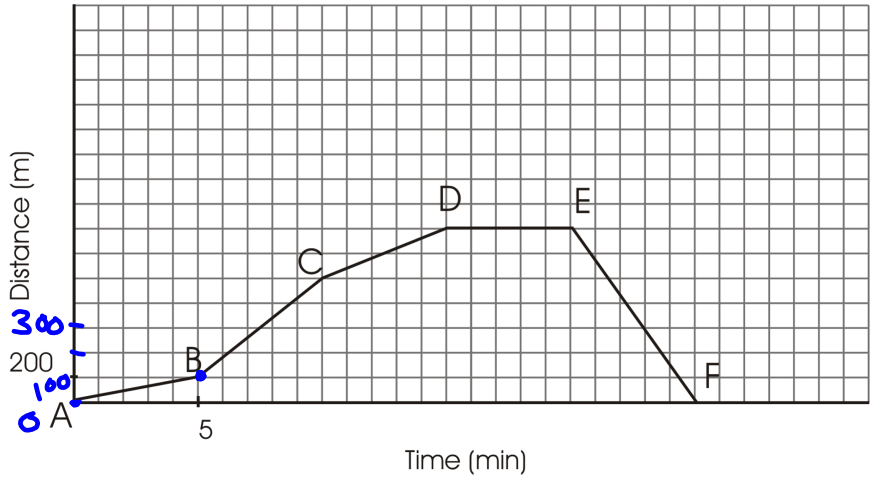
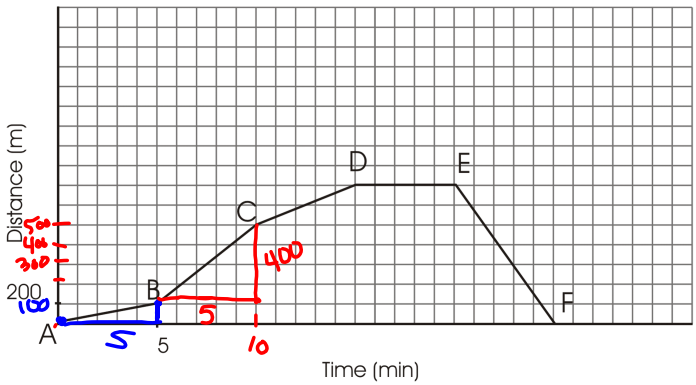
4.3-Rates of Change (Distance vs Time)

Chris runs each day as part of his daily exercise. The graph shows his distance from home as he runs his route.



Calculate his rate of change (speed) for each segment of the graph.



Calculate his rate of change (speed) for each segment of the graph.

Rate of Change of AB

$\text{Rate of Change} = \frac{\text{Rise}}{\text{Run}}$

$= \frac{100}{5}$

$= 20$

∴ the ROC of AB is 20 m/min

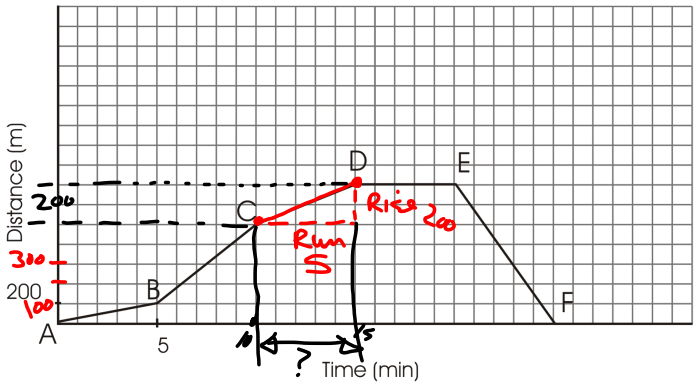
Rate of Change of BC

$\text{ROC} = \frac{\text{Rise}}{\text{Run}}$

$= \frac{400}{5}$

$= 80$

∴ the ROC of BC is 80 m/min



Calculate his rate of change (speed) for each segment of the graph.

Rate of Change of CD

$ROC = \frac{Rise}{Run}$

$= \frac{200}{5}$

$= 40$

∴ the ROC of CD is 40 m/min

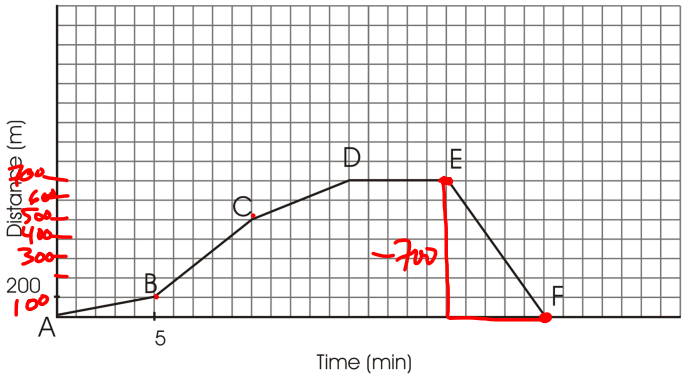
Rate of Change of DE

$ROC = \frac{Rise}{Run}$

$= \frac{0}{5}$

$= 0$

∴ the ROC of DE is 0m/min



Calculate his rate of change (speed) for each segment of the graph.

Rate of Change of EF

$ROC = \frac{Rise}{Run}$

$= \frac{-700}{5}$

$= -140$

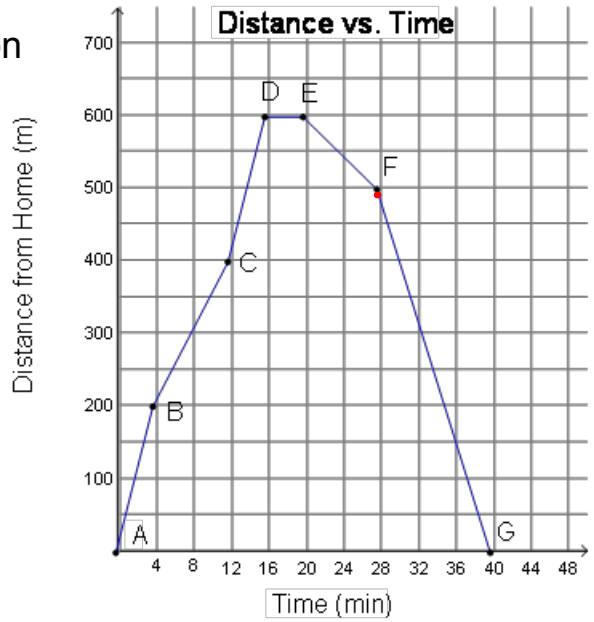
∴ the ROC of EF is −140 m/min

Backwards negative meaning

At 11 o'clock, Micha's mother sends him to the corner store for milk and tells him to be back in 30 minutes. Examine the graph.

1. Why are some line segments on the graph steeper than others?

– The steeper the line the faster he is moving.



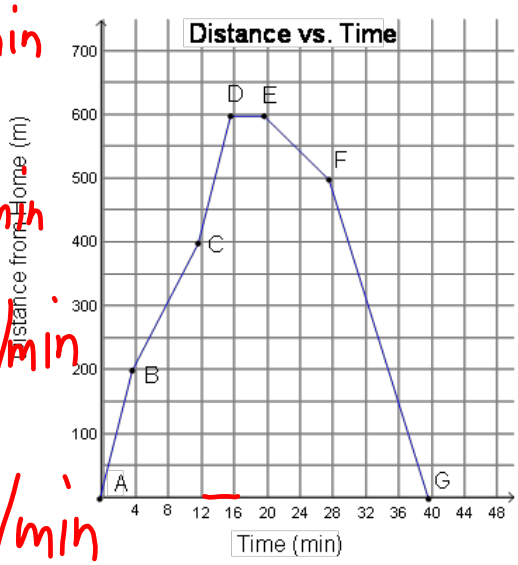
2. Calculate the rate of change (speed) of each of the line segments:

Rate of change AB = $\frac{200}{4} = 50$ m/min

Rate of change BC = $\frac{200}{8} = 25$ m/min

Rate of change CD = $\frac{200}{4} = 50$ m/min

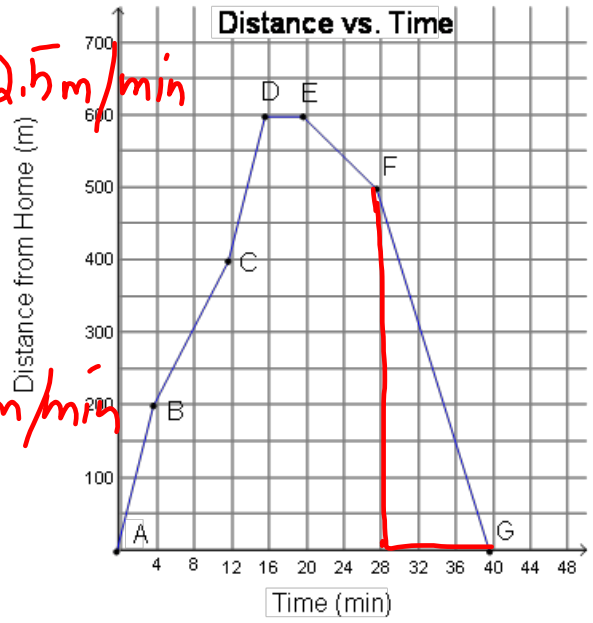
Rate of change DE = $\frac{0}{4} = 0$ m/min



Rate of change EF = $\frac{-100}{8} = 12.5$ m/min

Rate of change FG = $\frac{-500}{12}$

$= 41.7$ m/min

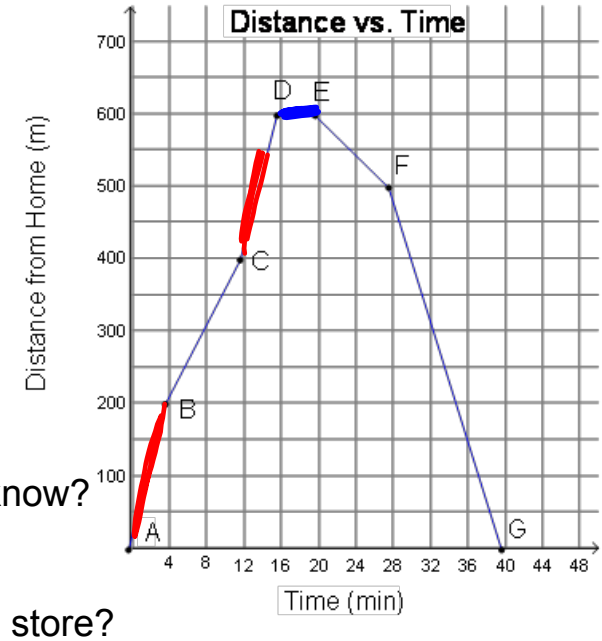


3. Over what interval(s) of time is Micha travelling

i) the fastest? CD & AB

ii) the slowest?

DE



4. How long did it take Micha to reach the store? How do you know?

16 m

5. How long did Micha stay at the store?

4 mins.

6. How long did it take Micha to get home from the store?

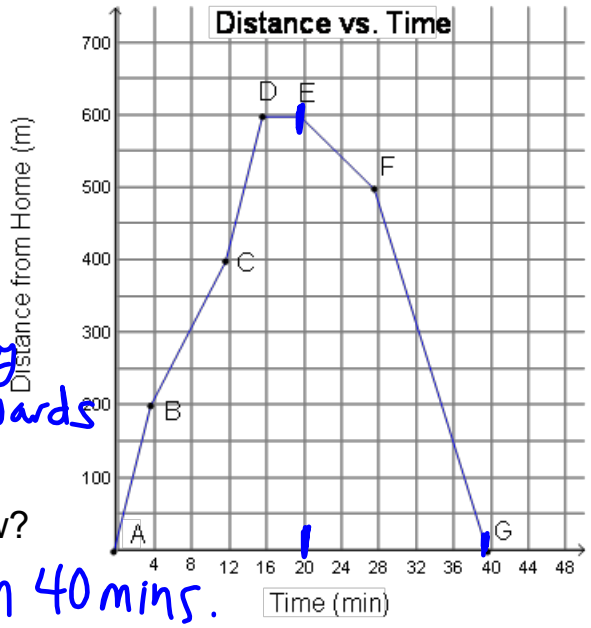
20 min

7. How can you use the graph to tell which direction Micha is travelling?

positive moving away
negative moving towards

8. Did Micha make it home in 30 minutes? How do you know?

No, he made home in 40 mins.



9. Using the information the graph provides, write a story that describes Micha's trip to the store and back.

Assigned Work

p.199 # 1, 2
p.203 # 1, 2, 5